DEC STD 074-17 Printer Systems Standard - Color Functions

DOCUMENT IDENTIFIER: A-DS-EL00074-17-0000 Rev A1, 31-Aug-1990

ABSTRACT: This section of DEC STD 074 describes color models and how they are used in Digital's printing devices.

APPLICABILITY: The requirements of this document are mandatory for Engineers designing hardware for terminal products and Software Engineers designing programs using terminal interfaces.

STATUS: APPROVED 31-Aug-1990; use VTX SMC for current status.

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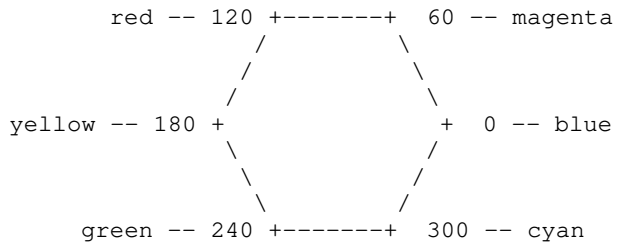
1 INTRODUCTION

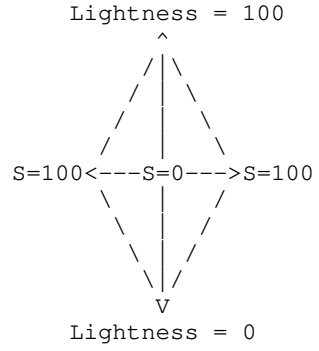
Two different color models, namely, HLS (Hue, Lightness, Saturation) and RGB (Red, Green, Blue) are currently used in Digital's low end color video and color printer devices.

The HLS color model forms a double hexcone. Hue is the angle around the vertical axis of the double hexcone, with blue at 0°. The complement of any hue is located 180 ° from the double hexcone. Lightness is 0 for black (at the lower tip of the double hexcone) to 100 for white (at the upper tip).

Saturation is measured radially from the vertical axis, from 0 on the axis to 100 on the surface.

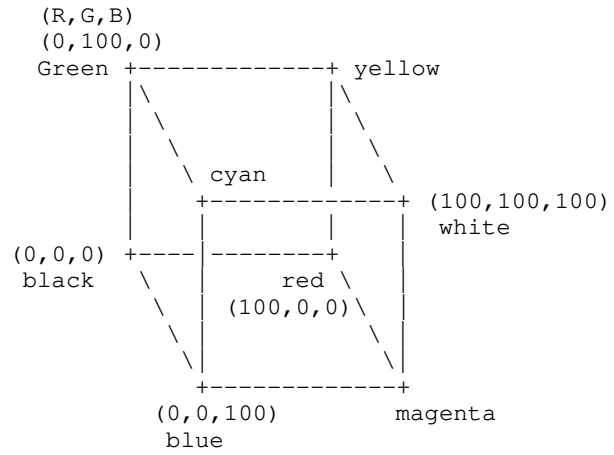
```
      HLS color model
--------------------------
Hue:          0-360 degrees
Lightness:    0-100 percent
Saturation:   0-100 percent
```





The RGB (red, green and blue) color model uses a cartesian coordinate system, and takes the form of a unit cube. The RGB primaries are additive, that is, the individual contributions of each primary color are added together to form a desired color. The main diagonal of the cube, with equal amounts of each primary, represents the gray levels.

```
    RGB color model
---------------------
Red:     0-100 percent
Green:   0-100 percent
Blue:    0-100 percent
```



Color Matching Mode

The color matching mode is used to produce an image on a color printer from an image on a video terminal or other video device. In order to print a color image that accurately represents the video image, this mode provides a finite pallette of 64 reference colors that are common to both the printing device and the video device. Such a pallette is required due to the varying numbers and types of pallette colors of different devices.

This method of color matching allows different devices to produce an image in as close to the same color as possible, depending on device limitations. This method assumes that the Business Color Matching Mode (DECBCMM) does not affect color matching results.

NOTE

This color matching mode was developed only for use with the LJ250. It is NOT recommended for implementation in any future products. Future work in this area is pending developments in the industry.

Business Color Matching Mode (DECBCMM)

The Business Color Matching Mode (DECBCMM) provides for color compatibility with Digital's VT241 Color Video Device.

NOTE

This control function (DECBCMM) is documented here as an exception to the PSRM architecture. We do NOT recommend that this be implemented by any future product.

To set DECBCMM, the Set Mode control function is:

```
CSI     ?     6     5     h
9/11   3/15  3/6   3/5   6/8
```

To reset DECBCMM, the Reset Mode control function is:

```
CSI     ?     6     5     l
9/11   3/15  3/6   3/5   6/12
```

When DECBCMM is set, the LJ250 is restricted to producing colors from a 64-entry "VT241 compatible" color pallette. When DECBCMM is reset, the LJ250 will use a 256 entry color pallette.

NOTE

On power-up, DECBCMM is reset to the 256 color pallette.

```
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